

## **DETAILED ACTION**

Claims 1-4, 6-16, and 22-25 are currently pending.

### ***Claim Objections***

In view of the amended claims, all objections in the prior Office Action are withdrawn.

### ***Claim Rejections - 35 USC § 112***

The U.S.C. 112, second paragraph rejection of claim 1 is maintained. Applicant argues that the meaning and scope of “ACK/NAK delay” and “time slots” are clear when read in light of the specification.

However, the claimed “ACK/NAK delay” and “time slots” are only definite with respect to the 1x EV-DV standard. See specification page 7, lines 17-25 and page 11, lines 6-12.

In other words, “ACK/NAK delay” and “time slots” are properties of the 1x EV-DV standard, and it would be necessary to read the 1x EV-DV standard into the claim in order for it to be definite. One of ordinary skill in the art would not have recognized the meaning and scope of “ACK/NAK delay” and “time slots” without reading 1x EV-DV into the claim. Because elements of 1x EV-DV (especially those relating to ACK/NAK delay) are considered to be essential to the invention (page 12, lines 27-28), those elements must be claimed.

***Response to Arguments***

Applicant's arguments filed 2/4/2009 have been fully considered but they are not persuasive.

Applicant argues that neither Seidel nor Fong teach or suggest such unique combinations of features or method steps as claimed.

The Examiner would like to emphasize that the claims are directed to an apparatus, **not** a method. As per MPEP 2114, apparatus claims must be structurally distinguishable from the prior art. The manner of operating the device does not differentiate an apparatus claim from the prior art.

The only structural element in claim 1 is a physical layer's HARQ controller. The physical layer is the first layer in the seven-layer OSI model\*. The two HARQ state machines are models of a system in which all values are discrete\*. (\*definitions provided by The Authoritative Dictionary of IEEE Standards Terms) In other words, these elements are purely abstract and do not further limit an apparatus structurally.

Applicant further argues that the Examiner has failed to present any evidence to support the rationale of obviousness in implementing state machines in Seidel.

The Examiner asserts that the claimed state machines are functional limitations that do not further limit the claim. Even if they did impart structure on the claim, the proposed combination teaches each and every limitation of the claim. A state machine is nothing more than a model of a system in which all values are discrete (see definition above). Anyone ordinarily skilled in the art would have recognized that the system of Seidel could have been modeled using known methods. For example, Seidel teaches a

model in Fig. 5 in which values are not discrete. It is noted that there were only a finite number of known methods for modeling the system of Seidel and Fong, one of which is shown in Fig. 5. One of ordinary skill in the art could have pursued the known potential options with a reasonable expectation of success.

The Examiner disagrees with the Applicant and maintains all rejections of claims 1-4, 6-16. All amendments and arguments by the Applicant have been considered. It is the Examiner's conclusion that claims 1-4, 6-16, and 22-25 are not patentably distinct or non-obvious over the prior art of record. Therefore, the rejection is maintained. Newly added claims 22-25 are rejected below.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 22-23 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 22 and 23 recite the term "time slot". The term "time slot" is a relative term which renders the claim indefinite. The term "time slot" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. It is therefore impossible to determine the length of a "time slot".

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
1. Claims 1-4, 6-16, and 22-25 rejected under 35 U.S.C. 103(a) as being unpatentable over Seidel et al (US Pat. 6,658,005; hereinafter referred to as Seidel) in view of Fong et al (US Pat. 6,760,860; hereinafter referred to as Fong).

As per claim 1:

Seidel teaches an apparatus for controlling the operation of the data channel in a mobile communication system that simultaneously a control message over the data control channel and the data over the data channel and supports hybrid automatic repeat request (HARQ) (abstract), the apparatus:

- a physical layer (col. 7, lines 62-65) for receiving the traffic data and the control message from the data control channel and the date channel separately and decoding the received traffic data and control data (col. 2, lines 26-28);

- processing a result of the decoding of at least one of the received control message and data (col. 7, lines 26-28; the result of decoding the sequence numbers in step 260 is used to decode PDUs in step 270) and for controlling the physical layer according to a result of the processing (col. 7, lines 35-37; an ACK must be sent on the physical layer according to the definition as provided above).

Not explicitly disclosed by Seidel is a physical layer's HARQ controller. However, Fong in an analogous art teaches a physical layer's HARQ controller (col. 5, lines 9-18). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the HARQ operations of Seidel to operate in the physical layer. This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that the teachings of Fong would have enabled the cooperative use of layer 1 and layer 2 ARQ to avoid unnecessary retransmission requests (col. 4, lines 51-57).

Seidel teaches receiving data from the physical layer (col. 7, lines 62-65); and determining an action based on the data received (col. 7, lines 35-37). Not explicitly disclosed by Seidel or Fong is that the physical layer's HARQ controller comprises two HARQ state machines for receiving state information from the physical layer and determining a state transition to next state.

However, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to implement the actions of Seidel above using state machines such as the one shown in Fig. 5. This modification would have been obvious

Art Unit: 2117

to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that state machines are models of a system, and that the system of Seidel could have been modeled using state diagrams which were well known to those in the art.

As per claim 2:

Seidel further teaches the apparatus of claim 1, wherein:

- the at least two HARQ state machines for control the state transition among a plurality of states, wherein the plurality of states includes an initial state for initializing parameters while waiting for the control message to be received over the control channel (Fig. 5, step 100), a control message decoding state for decoding the control message, a control state for calculating a result of the control message decoding (Fig. 5, element 260), a demodulation state for demodulating the received data channel (Fig. 5, element 270), a data decoding state for turbo decoding the demodulated data (Seidel teaches that Turbo encoding can be used in col. 5, lines 24-29; therefore the packet must be decoded), and a response state for transmitting a response based on a result of the turbo-decoding (col. 7, lines 32-34).

As per claim 3:

Seidel further teaches the apparatus of claim 1, further comprising a data path processor for controlling a processing path of data received over the data channel (processing is done by a processor in col. 5, lines 37-40).

Art Unit: 2117

As per claim 4:

Seidel further teaches the apparatus of claim 1, further comprising an output buffer controller for storing data obtained by demodulating and decoding data received over the data channel and outputting the stored data to the HARQ controller (a buffer controller must be present for the combining to take place as described in col. 7, lines 29-32).

As per claim 6:

Seidel further teaches the apparatus of claim 5, wherein an amount of delay for the response comprises 2 slots, wherein each of the two HARQ state machines alternately controls the state transition for 2 slots for the data received over the data channel (Fig. 5; the state machine controls the state transition for steps 260 and 270 which are two slots of data).

As per claim 7:

Seidel and Fong teach the apparatus of claim 6 above. Not explicitly disclosed is wherein decoding the data in the physical layer, the two HARQ state machines controls a transition to a waiting state until previous decoding operation of the decoder has ended.

However, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to transition to a waiting state on a state machine. This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that the packet must first be decoded before further action can be taken.

Art Unit: 2117

As per claim 8:

Seidel further teaches state processors for performing control operations of the HARQ state machine (col. 5, lines 37-40).

As per claim 9:

Seidel further teaches the apparatus of claim 1, wherein the physical layer comprises one data channel turbo decoder (Seidel teaches that Turbo encoding can be used in col. 5, lines 24-29).

As per claim 10:

Seidel further teaches the apparatus of claim 1, wherein the data channel is decoded by a turbo decoder (Seidel teaches that Turbo encoding can be used in col. 5, lines 24-29; therefore the packet must be decoded with a decoder).

As per claim 11:

Seidel further teaches the apparatus of claim 1, wherein the physical layer's HARQ controller requests a retransmission of the data from the mobile communication system when the results of the decoding indicate that the decoding was unsuccessful (col. 7, lines 33-34).

As per claim 12:

Seidel further teaches the apparatus of claim 1, wherein the physical layer's HARQ controller transmits the decoded data to an upper layer when results of the decoding indicate that the decoding was successful (col. 7, lines 32-33).

As per claim 13:



Seidel further teaches the apparatus of claim 1, wherein the physical layer comprises a control channel decoder for decoding the received control messages (Fig. 5, element 260), a demodulator for demodulating the received data, and a data decoder for decoding the demodulated data (Fig. 5, element 270).

As per claim 14:

Seidel further teaches the apparatus of claim 13, wherein the physical layer's HARQ controller determines whether to demodulate the data depending on the decoded control message and outputs the decoded control message to the demodulator and the data decoder when the HARQ controller determines to demodulate the data (col. 7, lines 23-28; the data is demodulated and decoded depending on the sequence numbers received on the control channel).

As per claim 15:

Seidel further teaches the apparatus of claim 1, wherein the physical layer's HARQ controller determines whether to demodulate the data depending on the processed result and outputs the result of the decoded control message to the physical layer when the HARQ controller determines to demodulate the data (col. 7, lines 23-28; the data is demodulated and decoded depending on the calculation of the beginning of the frame which is determined by the sequence numbers received on the control channel).

As per claim 16:

Seidel further teaches the apparatus of claim 1, wherein the physical layer's HARQ controller determine whether to demodulate and decode the received data

Art Unit: 2117

depending on the result of the decoding of the control message, outputs the decoded control message to the demodulator and the decoder during demodulation, decoding the received data (col. 7, lines 23-28; the data is demodulated and decoded depending on the sequence numbers received on the control channel), and controlling the output of a response signal according to the result of the decoding of the data (col. 7, lines 35-37).

As per claims 22-25:

Claims 22-25 recite functional limitations that fail to structurally limit the apparatus of claim 1. Furthermore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to selectively enable the “state machines”. As previously mentioned the state machines are system models and could be determined numerous ways. Dividing one system model into two system models connected to each other that are each active corresponding to certain conditions would only require ordinary ingenuity and common sense in the art. A state function section for “controlling” the state transition would have been necessary because one state must transition to another. Regardless of how the state machines are used and how many state machines are used, the end result does not change just because the model that describes a particular result can be shown in different ways.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

Art Unit: 2117

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to STEVE NGUYEN whose telephone number is (571)272-7214. The examiner can normally be reached on M-F, 10am-6:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jacques Louis-Jacques can be reached on (571) 272-6962. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2117

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